



# 12½ MINUTES



with AISC's Engineering & Research Department

## A REVIEW OF RECENTLY RELEASED AISC PUBLICATIONS

As a reminder, the following publications were released over the past year by AISC:

- **AISC Specification for the Design of Steel Hollow Structural Sections (HSS)**

This document contains Load and Resistance Factor Design criteria for round, rectangular and square hollow structural sections (HSS) in tension, compression, flexure, shear, torsion and combined loading. It is intended to be compatible with and a supplement to the 1993 AISC Load Resistance Factor Design Specification for Structural Steel Buildings.

- **AISC Hollow Structural Sections (HSS) Connections Manual**

The new Manual is a guide to shear, moment, bracing, and truss connections for HSS members. The Manual includes both HSS-to-HSS connections and HSS-to-wide-flange connections. Its format is similar to that of the AISC Manual of Steel Construction, Volume II-Connections, except that it is specifically focused on HSS connections.

- **AISC Design Guide Torsional Analysis of Structural Steel Members**

Steel Design Guide Series Nine covers the analysis and design of structural members subjected to torsional loading. An update of the former AISC publication of similar name, coverage includes fundamentals of torsional theory, determination of torsional stresses, Specification provisions, and serviceability issues. Design examples illustrate the design

process as well as the use of design aids.

- **AISC Design Guide Erection Bracing of Low-Rise Structural Steel Frames**

Steel Design Series 10 provides useful information and design examples for the design of temporary lateral support systems and components for low-rise buildings. Part One includes detailed engineering calculation for the justification of temporary bracing systems. Part Two provides prescriptive systems for temporary bracing as well as engineering guidance to foster structural details that are inherently erectable.

- **AISC Design Guide Floor Vibrations Due to Human Activity**

Steel Design Guide Series Eleven provides the basic principles and simply analytical tools to design steel framed floor systems and footbridges for vibration serviceability due to human activities. Both human comfort and the need to control movement for sensitive equipment are considered. Remedial measures for problem floors are discussed.

- **A Guide to Engineering and Quality Criteria for Steel Structures, 4th Edition (1997)**

This reference has been prepared to: (1) familiarize engineers, architects, fabricators, erectors, inspectors and owners with the techniques and tolerances of standard steel fabricating practice and with the economic effect of special workmanship requirements; and, (2) to provide engineering guidance in answer to common questions in steel design and fabrication.

**Charles J. Carter, P.E.**  
Director of Manuals

## NEHRP GUIDELINES FOR THE SEISMIC REHABILITATION OF BUILDINGS

After seven years of dedicated efforts by scores of leading practitioners and experts in the field, the subject document dated October, 1997, also referred to as FEMA-273, is now available from the project sponsor, the Federal Emergency Management Agency (FEMA), and the Building Seismic Safety Council (BSSC). As the title implies, the Guidelines are intended for application with existing buildings.

This project was managed by the BSSC and the final review of the Guidelines underwent its consensus balloting process. Major contributions to this document were made by the Applied Technology Council (ATC) and the American Society of Civil Engineers (ASCE). The Guidelines content includes general requirements for rehabilitation, modeling and analysis, foundations and geotechnical, and several materials chapters, among them steel and cast iron. An extensive Commentary accompanies the Guidelines.

For further information on this document or related seismic activities, contact BSSC, (202) 289-7800 in Washington, DC.

**Nestor R. Iwankiw, P.E.**  
Vice President, E&R

## ERECTOR CERTIFICATION PROGRAM UNDERWAY

After approximately two years of rigorous development work, we are happy to announce that the new AISC Erector Certification

Program is officially up and running. There has been a great deal of interest in the Program. Over 120 requests for information have been received. Eighteen auditor candidates for the Quality Auditing Co. (QAC) with 6½ centuries of collective experience in steel construction met in Bristol, VA to train how to conduct audits under this program. The first group of applications have been received and reviewed and the first four erector companies have been certified. QAC is also responsible for conducting audits for the long-running AISC Fabricator Certification Program.

If you would like to know more about the program, call AISC at 312/670-2400.

**Thomas J. Schlafly**  
Director of Fabrication,  
Operations & Standards

## AISC ANNOUNCES FUNDING FOR FOUR STEEL RESEARCH PROJECTS

Under the supervision of its reorganized Committee on Research, the American Institute of Steel Construction, Inc. announced that funding has been approved for four structural steel-related research projects.

- **Design Procedures for Extended Shear Tab Connections: Beam Attached to Column Web and Beam Attached to Beam Web**

While shear tabs (single-plate connections) are regularly used as an economical means of providing simple beam-to-column flange and simple beam-to-beam web connections, there are no recognized procedures for the use of extended shear tabs on the webs of wide-flange columns or on the webs of girders. For these conditions, expensive coping or flange reduction of the framing beams may

often be required. This research program will conduct testing and analysis to establish design procedures for the use of extended shear tab connections.

- **Seismic Behavior of Steel Column Bases**

Column bases are an essential element of every steel moment-resisting or braced-frame structure. However, designers face two critical issues:

- 1) How to design a column base for combined axial, moment and shear forces?

- 2) What degree of fixity can be counted upon for a given column base design and detailing for cyclic loads?

Neither of these issues are explicitly addressed in the current AISC LRFD Manual of Steel Construction.

The research will establish realistic seismic resistance mechanisms of the column base connections and help to formulate rational design models.

- **Serviceability Requirements for LRFD Specification N690 for Steel Safety Related Structures for Critical Facilities**

A survey of technical personnel active in the design, construction and maintenance of nuclear power plant facilities will be conducted to obtain information on the current practice in checking structural serviceability in nuclear power plants. In addition, the research will solicit suggestions for modifications to procedures now in use. Recommendations for serviceability limits, based on the results of the survey, will be presented to AISC Task Committee 14 on Nuclear Power Plant Design for consideration in the updating of AISC Specification N690 to LRFD.

- **Inelastic Rotation Capability of End-Plate Moment Connections**

This research is designed to allow the use of bolted end-plate moment connections in ordinary and intermediate moment frames under seismic loading conditions. The NEHRP Guidelines require experimental verification of the inelastic rotation capability of end-plate moment connections for fully restrained connections in ordinary, intermediate and special moment frames. Prior research has shown that four-bolt, extended, unstiffened end-plate connections have the required inelastic rotation capability for at least intermediate moment frames. This research will expand on that research for five other commonly used end-plate configurations.

Thomas M. Murray, Montague-Betts Professor of Structural Steel Design at Virginia Tech, will conduct the research, which is partially funded by the Metal Building Manufacturers Association. The results of this research should allow greater use of this moment connection for seismic frames without further qualification testing.

For more information on these, or other research projects, contact Jacques Cattan at 312/670-5430, who is the AISC staff engineer responsible for research.

**Jacques Cattan**  
Senior Staff Engineer—  
Structures

## LRFD SUPPLEMENT

A Supplement to the current (1993) LRFD Specification will be published by AISC in May, 1998. Labeled "Supplement No. 1", it will contain all the revisions that have been approved to date by the AISC Committee on Specifications.

Subscribers to the AISC Engineering Journal will receive the Supplement with the Third Quarter, 1998 issue and this

Supplement will be included in future purchases of the AISC Manual and LRFD Specifications. Others can order the Supplement at no charge from AISC by calling (800) 644-2400 after May, 1998.

**Abraham J. Rokach, P.E., S.E.**  
**Director of Building Design**

## **AISC/SSPC FUNDED K-AREA RESEARCH UNDERWAY AT ATLSS CENTER**

Reports on the potential for crack initiation at, or near, connections in the "k" area of wide flange rotary straightened members (see AISC Advisory date January 9, 1997 MSC, February, 1997 and News Briefs, page 23, September 1997 MSC) has led the American Institute of Steel Construction, Inc., to initiate research funding of a major 4-project, 3-year program on this issue. A special AISC research subcommittee discussed this subject over three meetings during the previous year and identified the needed research. The Structural Shape Producers Council (SSPC) has committed to partial funding of the effort.

The "k" area is the region extending from approximately the midpoint of the radius of the fillet into the web approximately 1 to 1½ inches beyond the point of tangency between the fillet and web. Most of the incidents occurred at highly restrained joints with welds

in this area.

Alan W. Pense, a professor emeritus at Lehigh University has been awarded an AISC grant for 12 months to study the "Characterization of Cyclic Inelastic Strain Behavior on Properties of A572 Gr. 50 and A913 Rolled Sections." Pense will work with several of his colleagues at Lehigh's ATLSS Center, including Eric J. Kaufmann, Senior Research Engineer, and John W. Fisher, Center Director.

This Lehigh research project is intended to establish the cyclic stress-strain behavior of A36 and A572, Gr. 50 rolled sections manufactured between 1960 and 1975 and A572, Gr. 50 and A913 rolled sections manufactured currently. This critical research will help to accurately determine these material properties and whether—or how—they may effect fabrication practice and design performance.

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